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[ ] Theory [ ] Experiment

DIII-D Magnetic Diagnostics Upgrade for Non-axisymmetric Fields,* E.J. Strait, *GA*; J.D. King, C. Paz-Soldan, *ORISE*; J.M. Hanson, D. Shiraki, *Columbia U.*; N.C. Logan, *PPPL*; R.L. Boivin, D.A. Taussig, M.G. Watkins, *General Atomics* – A recent upgrade has expanded DIII-D's capabilities for measurement of non-axisymmetric fields such as resistive wall modes, locked tearing modes, and the stable plasma response to error fields and applied non-axisymmetric perturbations. The upgrade includes the addition of over 100 new poloidal field and radial field sensors inside the vacuum vessel. Combined with previously installed sensors, these allow simultaneous resolution of toroidal mode numbers $n \leq 3$ on both the low field side and high field side, and provide poloidal resolution as small as 14 cm on the high field side. The large contribution of the axisymmetric field is eliminated by differential measurements of approximately 120 pairs of toroidally separated sensors, using special dual-input integrators. Initial results from the new system will be compared to predictions of 3D equilibrium and stability codes.

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